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## Chapter 19

# XS Reports & Limits of Construction

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## 19.1 Objectives

- Create various cross section reports:
  - for plan use (design elements and quantities)
  - as input for other programs and/or applications of GEOPAK
  - for construction layouts
- Create and plot construction limits in the plan view.

## 19.2 XS Reports Definitions

The GEOPAK Cross Section Report Utility can extract up to sixteen different reports from original and design cross-sections. For each report generated, the user must set the parameters of the existing and/or design cross sections. GEOPAK also provides an option to make custom headers for each of the reports via the **User** pull down menu.

## 19.3 XS Reports Accessing

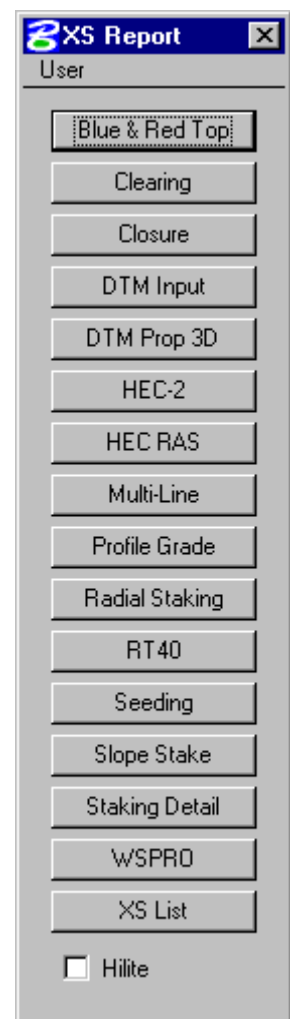
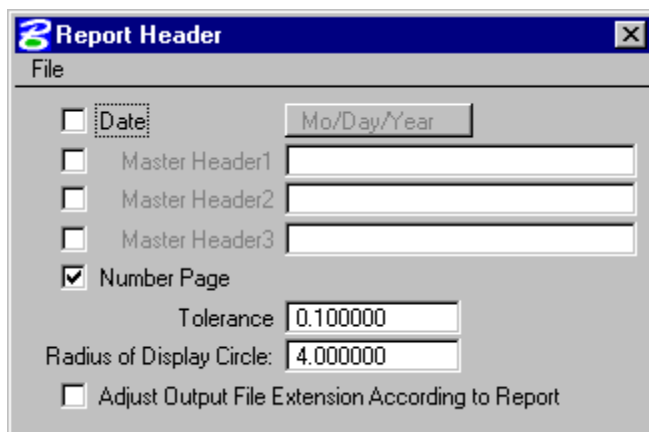
To access the **XS Report** select **Project Manager >> Reports & XS Quantities**.

## 19.4 XS Reports Dialog



From the **XS Report** dialog box select **User >> Preferences**; a **Report Header** dialog box will appear with all options ghosted out. To activate the individual fields simply toggle on the box next

to the desired field. Once you have completed the dialog box, the information will be saved as an **.hdr** file. This allows for the creation of a separate header for each type of report. The tolerance field determines the maximum gap allowed between cross section elements.



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## 19.5 Reports

### 19.5.1 Blue and Red Top

Based on the dialog box settings, GEOPAK determines the offset and elevation of a slope and its breakpoints. **Blue** refers to the top of pavement and **Red** is the top of subgrade. The user must determine this by indicating the level, color, weight and style for each surface.

### 19.5.2 Clearing

The **Clearing Report** is useful for obtaining clearing and grubbing quantities. For each station, GEOPAK will list the clearing distance on each side of the chain and the width of any exception. You can obtain the results in meters squared and/or hectares. Toggle boxes for Cut Slope Rounding, Additional Clearing in Cut and Fill, and Minimum Clearing Width are provided for increased control over the output.

GEOPAK can also generate quantity sub-totals based on the value specified in **Sub Every**.

To use the **Except Width** option, you must have an existing ASCII file that includes the Beginning and Ending Station and Exception Width.

Once everything is set, you can output the information to an ASCII file

### 19.5.3 Closure

The **Closure Report** provides information on the intersection point between the user defined proposed finish grade and existing ground. In addition to the ASCII report, the designer may instruct GEOPAK to close any gap either by drawing a vertical line between the endpoint of the proposed finish element and the existing ground or extending the slope of the last proposed element to intersect existing ground. The procedure will not extend existing ground. The **Closure Report** can be accessed within any Microstation cross section file by selecting Closure from the main XS Reports dialog

### 19.5.4 DTM Input

This process generates XYZ coordinates from cross section elements and places this information into an ASCII file for use in Geopak's DTM package. To use this dialog box simply enter the .gpk job number, chain name and station range. GEOPAK will read the cross section elements based on level, weight, color and style.

### 19.5.5 DTM Proposed 3D

This report is similar to DTM Input except that you can set both original and proposed cross sections at the same time. This report also differs in that it makes breaklines across the cross sections. This report is mainly useful when making 3-D cross sections for modeling purposes.

### 19.5.6 HEC-2

This process reads cross section elements and formats the information in an ASCII text file suitable for use in the HEC-2 hydraulic program.

### 19.5.7 HEC RAS

This process reads cross section elements and formats the information in an ASCII text file suitable for use in the HEC RAS hydraulic program.

### 19.5.8 Multi-Line

This report is useful in creating cross-sections for staged construction. Begin by entering the job number, chain name and station limits. Primary cross section element parameters must be completed before secondary element parameters. This is important due to the order in which GEOPAK reads the information. Once all the parameters have been entered, the new cross sections may be drawn to the design file or you may choose the display only option. An ASCII text file will be generated.

### 19.5.9 Profile Grade

The **Profile Grade Report** is one of the most versatile reports available. It prints existing ground and design grade elevations and low point elevations for each cross section. Additionally, this report has the ability to create horizontal and vertical alignments along the low points and store them directly into the .gpk. Horizontal alignments created from this report will start with station 0+000 and have no curves.

### 19.5.10 Radial Staking

The **Radial Staking Report** is a specialized report created for the U.S. Federal Highway Administration (FHWA).

### 19.5.11 RT 40

The **RT 40 Report** produces RDS based RT40 data. To use this dialog box simply fill in the job chain name, stationing range and the parameters of the cross section elements you wish to use.

### 19.5.12 Seeding

Other than the usual entries, the user must enter the parameters of the elements to be seeded.

This dialog box includes slope and subtotal options as well as a way to limit the number of segments read (**By-Pass Segments**). The user may also establish additional seeding specifications (**Additional Distance**).

Once all of the settings are complete, the report is written to an ASCII output file for use in plan quantities.

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### 19.5.13 Slope Stake

The **Slope Stake Report** is a special format report developed for the FHWA. This report generates offsets, elevations and superelevation information for each cross section. To generate this report fill in the usual cross section parameters plus Subgrade and Hub Staking information. When complete, push Apply and the report is written into an ASCII file.

### 19.5.14 Staking Detail

The **Staking Detail Report** determines the tie down point between the proposed finished grade and the existing ground. GEOPAK will list the right and left offset, elevation, slope of the finish grade and superelevation rate for each cross section. To create this report, fill in the project information and desired cross section elements' parameters. Once complete, you have the choice between two formats, a FHWA ASCII report or a Montana DOT report (includes ditch elevations).

### 19.5.15 WSPRO

This report takes the cross section elements and turns them into an ASCII file in the WSPRO format for use as input in the WSPRO hydraulic analysis program.

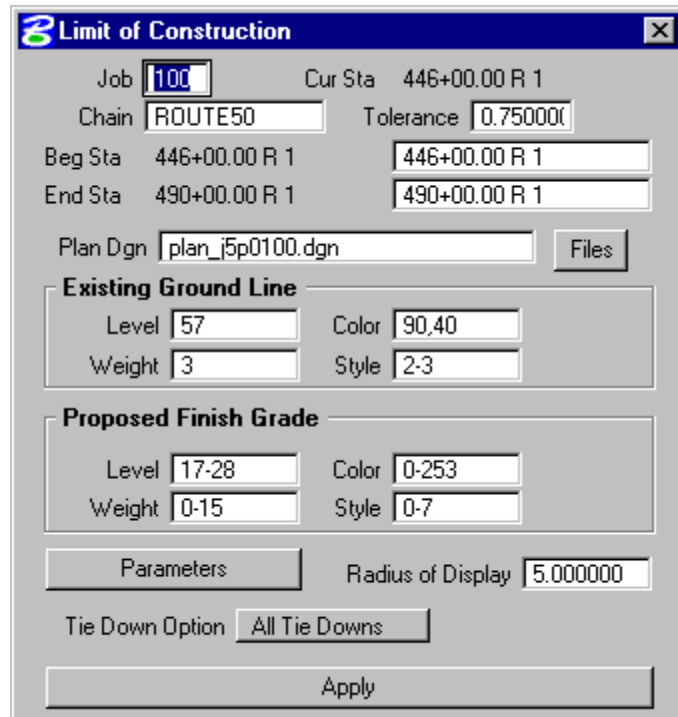
### 19.5.16 XS List

This report creates a listing of elevations and offsets for each cross section element according to user defined parameters. You have the option of creating either an original cross section list or a design cross section list. These reports are very similar to RDS cross section lists.

**Note: For more information on the various reports and the dialogs, see the Geopak manual or the online help.**

## 19.6 Accessing Limits of Construction

To access the **Limits of Construction** dialog, go to **Project Manager >> Limits of Construction**. After the run is chosen, the following dialog opens.



The **Limit of Construction** dialog box contains the following fields and controls:

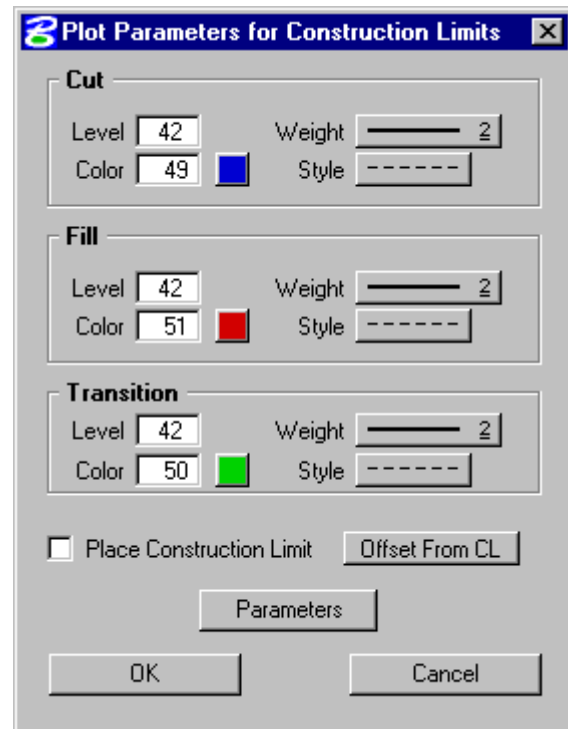
- Job:** 100
- Cur Sta:** 446+00.00 R 1
- Chain:** ROUTE50
- Tolerance:** 0.750000
- Beg Sta:** 446+00.00 R 1
- End Sta:** 490+00.00 R 1
- Plan Dgn:** plan\_j5p0100.dgn
- Files:** button
- Existing Ground Line:**
  - Level:** 57
  - Color:** 90,40
  - Weight:** 3
  - Style:** 2-3
- Proposed Finish Grade:**
  - Level:** 17-28
  - Color:** 0-253
  - Weight:** 0-15
  - Style:** 0-7
- Parameters:** button
- Radius of Display:** 5.000000
- Tie Down Option:** All Tie Downs
- Apply:** button

## 19.7 Processing Limits of Construction

The user can specify the .gpk job number, the centerline, and the file containing the plan view information. The **Working Alignment** should fill the **Existing Ground** and the **Proposed Finish Grade** sections.

The **Parameters** button opens the dialog box below. The symbology for the cut, fill, and transition construction limits can be set in this dialog.

The **Place Construction Limit** toggle allows the user to place various text strings along the construction limits. Selecting the **Parameters** button, and making the desired changes in the dialog box shown below will set the symbology for these text strings.



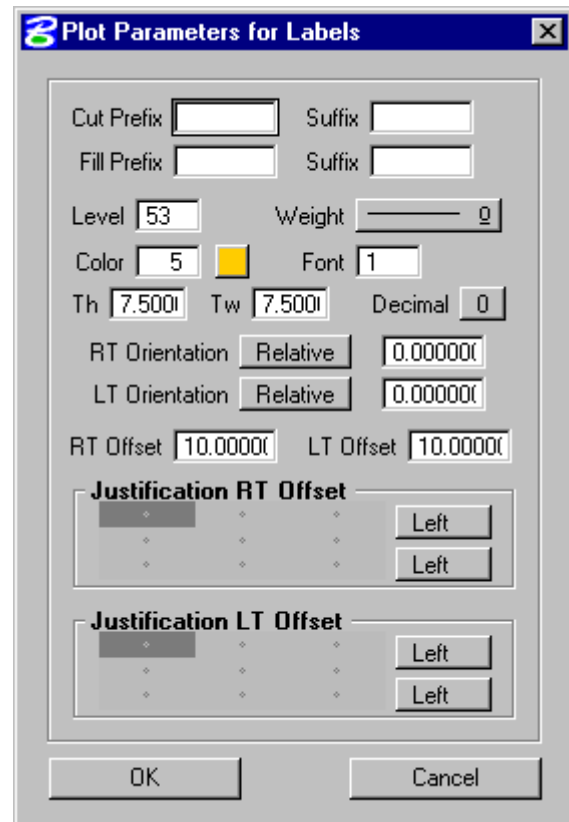
The **Plot Parameters for Construction Limits** dialog box contains the following sections and controls:

- Cut:**
  - Level:** 42
  - Color:** 49 (blue swatch)
  - Weight:** 2
  - Style:** dashed line
- Fill:**
  - Level:** 42
  - Color:** 51 (red swatch)
  - Weight:** 2
  - Style:** dashed line
- Transition:**
  - Level:** 42
  - Color:** 50 (green swatch)
  - Weight:** 2
  - Style:** dashed line
- Place Construction Limit:** checkbox (unchecked)
- Offset From CL:** button
- Parameters:** button
- OK:** button
- Cancel:** button

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The **Radius of Display** field is the size of the display circle when Geopak is scanning the cross-sections. The last option in the main **Limits of Construction** dialog is the **Tie Down Option**. There are two **Tie Down Options**. If the **All Tie Down** option is set, all tie downs within a section are plotted. (I.e. wide medians, outer roadways, ramps, etc. may have tie downs in between the limits of the main roadway, and the outer roadway or ramp.) If the **Outer Tie Down** option is selected, then only the outmost tie downs are plotted.

Once the **Apply** button is chosen, the limits of construction and the optional text are drawn into the plan view file.



The image shows a software dialog box titled "Plot Parameters for Labels". It contains various input fields and buttons for configuring label plots. The fields include:

- Cut Prefix: [ ] Suffix: [ ]
- Fill Prefix: [ ] Suffix: [ ]
- Level: 53 Weight: 0
- Color: 5 (yellow square) Font: 1
- Th: 7.500 Tw: 7.500 Decimal: 0
- RT Orientation: Relative 0.00000
- LT Orientation: Relative 0.00000
- RT Offset: 10.0000 LT Offset: 10.0000
- Justification RT Offset: [ ] Left [ ]
- Justification LT Offset: [ ] Left [ ]

At the bottom are "OK" and "Cancel" buttons.